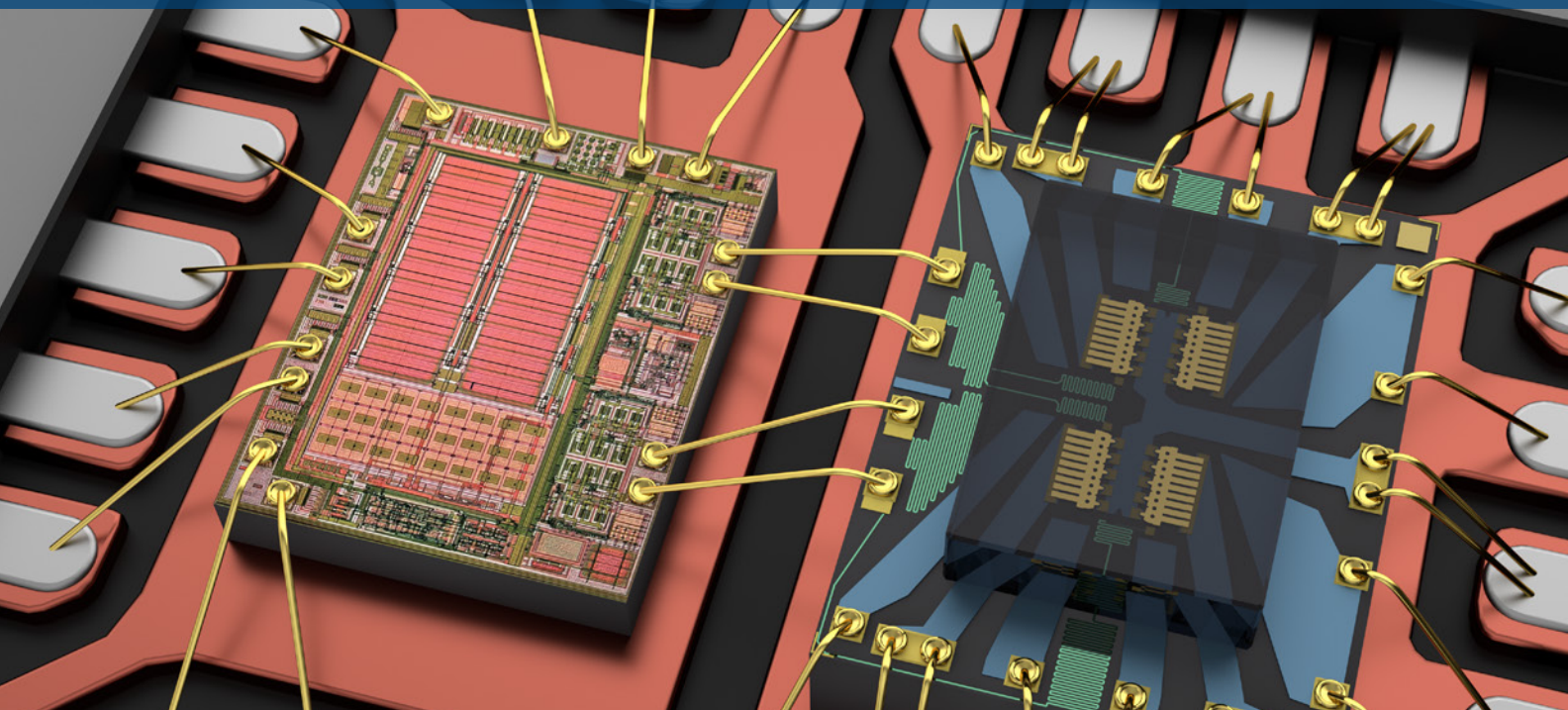


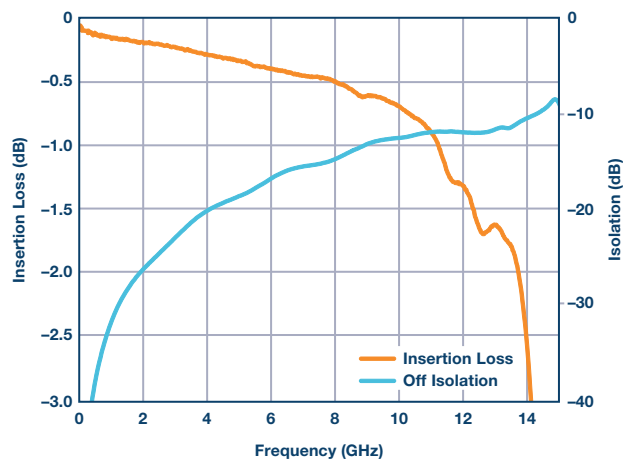
ANALOG DEVICES MAKES MEMS SWITCH TECHNOLOGY A COMMERCIAL REALITY



Product Overview

- ▶ The [ADGM1304](#) and [ADGM1004](#) are single-pole, four-throw (SP4T) switches fabricated using Analog Devices internal microelectromechanical systems (MEMS) switch technology.
- ▶ This state-of-the-art technology enables a vastly smaller, more reliable, power-saving, lighter, faster switching, and wider bandwidth relay replacement solution.
- ▶ The ADGM1304 and ADGM1004 are highly linear, low insertion loss switches that are fully operational from 0 Hz/dc up to 14 GHz and 13 GHz, respectively. The ADGM1004 is further optimized with a 2.5 kV HBM ESD rating.
- ▶ A copackaged, low voltage, standard logic compatible driver IC generates the high voltage necessary to internally electrostatically actuate the switch. All four switches are also independently controlled for maximum flexibility.

ADGM1304 Insertion Loss and Off Isolation

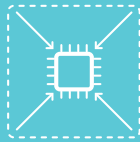


ADGM1304/ADGM1004

Highlights to Remember



Gold
cantilever
type designs



20× smaller
than typical
EM relays



>10× reduction
in power usage



>20× lighter
than typical
EM relays

Actuation (on/off cold-switching) lifetimes



DSLR
100k



EM relays
10M



Keyboard
50M

500M



MEMS switch
1B

30× faster switch turn on time
(with no sound)



EMR
1000 μ sec



MEMS switch
30 μ sec

MEMS contact gap
(over 100× less than hair width)



50,000 nm
wide



MEMS switch
300 nm
contact gap

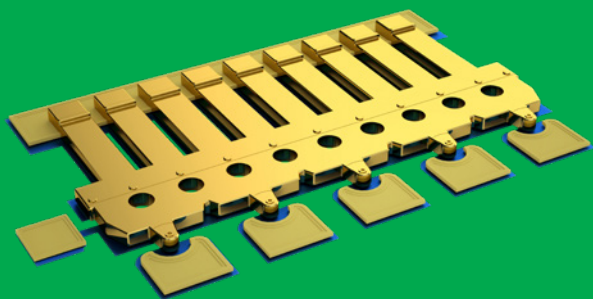
Maximum usable bandwidth
0 Hz/dc to 14 GHz+



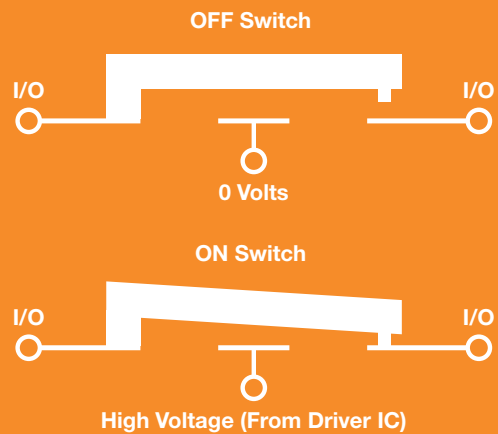
dc



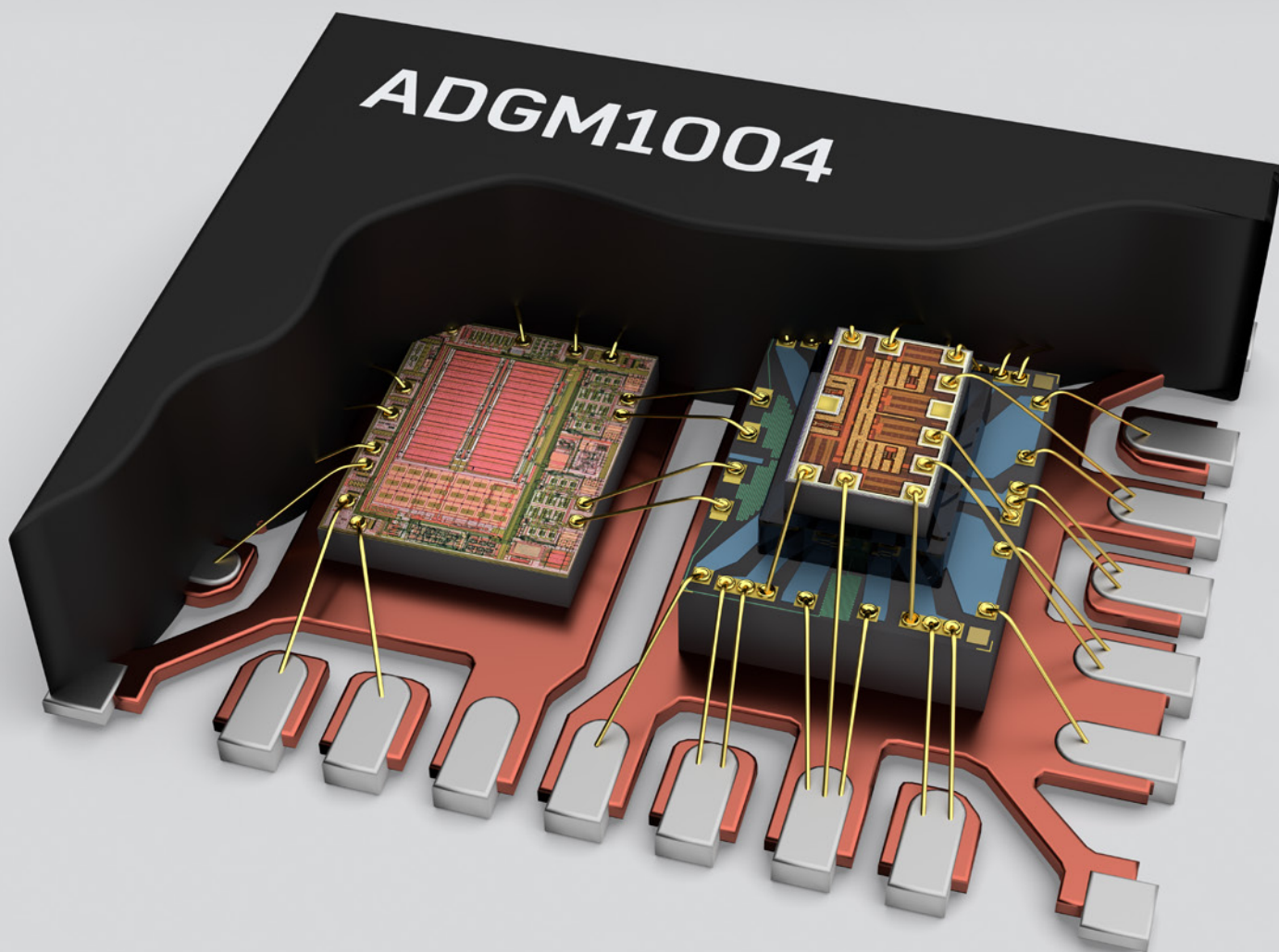
mmW



MEMS Switch Cantilever Structure



MEMS Switch Cantilever Actuation Mechanism



ADGM1004 MEMS switch showing inbuilt, low voltage/low power driver on left, MEMS switch on right (SP4T) with mounted, solid-state, 5 kV HBM ESD protection die on RF pins.



ADGM1004 MEMS switch on top of a typical EMR, with up to 95% volume saving.

Introducing a revolutionary 0 Hz/dc to GHz switching solution. Innovative thinking and a proprietary approach offer a superior alternative to conventional relay approaches. Discover what MEMS switch technology can do for you in instrumentation, aerospace and defense, health-care, communications, and other key markets.

Visit analog.com/MEMSswitch

User Guides

UG-644: Evaluating the ADGM1304 0 Hz/DC to 14 GHz, Single-Pole, Four-Throw MEMS Switch with Integrated Driver (Rev. A)

Technical Articles

The Fundamentals of Analog Devices' Revolutionary MEMS Switch Technology

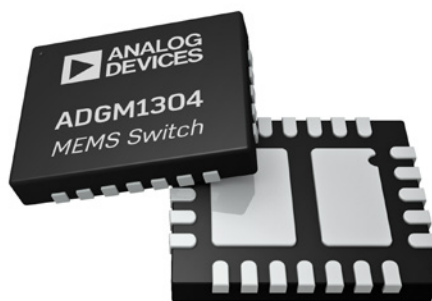
Groundbreaking 5 kV ESD MEMS Switch Technology

Circuit Notes

CN-0377: DC to 2.5 GHz Switchable RF Attenuator Implemented with RF MEMS Switches (Rev. A)

Press Release

Analog Devices Makes MEMS Switch Technology a Commercial Reality



ADGM1304/ADGM1004:
5 mm × 4 mm × 0.95 mm/1.45 mm LFCSP.

Part Number	Device Configuration	Switch R_{ON} (Typ)(Ω)	Leakage Switch Off (Typ) (pA)	Frequency Response (Min) (Hz)	Frequency Response (Max) (GHz)	Insertion Loss (Typ) (dB)	Off Isolation (Typ) (dB)	IIP3 (Typ) (dBm)	Input Power (Max) (dBm)	Specified at Frequency (GHz)
ADGM1004	(4:1) × 1	1.8	500	0	13	0.45	24	67	32	2.5
ADGM1304	(4:1) × 1	1.6	500	0	14	0.26	24	69	36	2.5

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